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INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY

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REPORT

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Direction Finder Station near Sarmellek AirfieldGeneral Information

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Location and Area

2. Terrain around the D/F station was gently rolling, hilly country. The D/F station was located on the western slope of a hill at a height of about 80 meters. It occupied an area of about 34 meters square. All fixed radio equipment was located in the station house, Figure 2, Point (1). The D/F station itself was a one-story concrete building with a flat roof, measuring about 7x6x2½ meters.

Electric Power

1. Electric power was derived from a main power line which ran along the macadam road, Figure 1, Point (2). Its source was unknown. Emergency power was obtained from a gasoline-driven generator and 15 batteries about 50x25x30 cm, which together could hold a charge for about 30 to 45 hours.

Equipment

1. The following radio equipment was located in the D/F station:

- a. Five transmitter-receiver sets, referred to as R-40s (Figure 8).
- b. Two or three radio beacon transmitters (Figure 6).
- c. One radio-goniometer, a British set with English inscriptions, referred to as a "Marconi" (Figure 7).
- d. One transmitter-receiver for voice transmission with a built-in loudspeaker, referred to as a "Fonia" (Figure 9). The radio beacon was in constant operation sending out fixed signals.

Weather

1. During [redacted] weather was sunny and mild.

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Stock or Repair Depots

1. A small repair shop and stock depot for radio equipment was located at Sarmellek Airfield, Figure 1, Point (7).

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Antennas

The antenna system was referred to in Hungarian as the "Varsa" system (See Figures 2, 3, and 4) and was manufactured and installed by the Electrotechnical Small Industries Cooperative, located at Sallai Imre utca 4, Budapest. A "Squirrel-Cage" dipole-type antenna array, it was mounted on eight wooden masts, about 14-16 meters high. The antenna masts were about 60 cm. in diameter at the base and about 25 cm. at the top. The masts were set four meters deep in the ground, braced by two poles (see points (E) and (F) of Figure 4 and were further braced by guy wires anchored one meter deep in concrete (see Point (C) of Figures 2 and 4). The antenna masts were soaked in oil to prevent decay.

Short Wave Antennas

The "Squirrel-cage" antennas were secured to the masts by winches, and could be hoisted and lowered manually. (See Point D of Figures 2 and 4) It took two men about 10 minutes to lower one antenna section. Each section between two masts was about 8.5 meters long, and consisted of a series of eight strings of copper wire, arranged in a circular shape with a diameter of one meter, tapering down to a cone at the point of connection to the antenna mast (See Point AA of Figures 2 and 4). These eight "squirrel-cage" antennas were for short-wave transmission and were connected parallel to the R-40 transmitter-receiver units in the D/F station (for details of the short-wave lead-in antenna see Point B of Figures 2 and 4, and Point A of Figure 11).

Long-Wave Antenna

The long-wave antenna was a copper cable wire about 25 meters long, and was connected to the radio beacon transmitter. (See Points (7) and (H) of Figures 2 and 3)

Personnel

The D/F station had a complement of seven airmen, headed by a Master Sergeant who was the detachment commander. These men had the following duties:

- a. The commander supervised and was responsible for the over-all operation of the D/F station.
- b. One airman operated the gas-driven generator and the radio switch control panel.
- c. Four airmen operated the R-40 transmitters and receivers, the voice transmitter and receiver (Fonia) and the radio beacon transmitter.
- d. One airman was assigned to the radio-goniometer.

All airmen were trained radio operators and mechanics, able to

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send and receive Morse code and attend to minor repairs. Microphones were used for voice transmission on the "Fonia" and radio-goniometer. Telegraph keys were used with the R-40 transmitters. Typewriters were not observed in the radio room; all transmissions were recorded in writing. Headphones were used with the R-40 sets and the "Fonia" which also had a loud-speaker. Teletype machines were located at Sarmellek Airfield, exact location unknown.

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1. Each piece of equipment had a complete repair and wiring instruction and calibration chart written in simple language. They were signed out to the non-commissioned officer in charge, who had to sign them over to the next duty officer.

Miscellaneous

2. A specially trained maintenance crew of two or three airmen checked all equipment about four times a year. These maintenance operations were usually accomplished on days when there was no flying. The operating personnel could not do any repair work without the specific approval of the FRIZZ Commander at Sarmellek Airfield. Source was not familiar with radio tubes used in any of the equipment. A radio beacon transmitter was observed which automatically sent fixed radio signals (See Figure 6).

Identification Data

3. Figure 1, on page 13, is an overlay on Sheet 5358 E (8 11) AM Series M 773, Kiskomárom, Hungary, 1:50,000, pinpointing the direction finder station of Sarmellek Airfield. Following is the legend to this overlay. Numbers in parentheses refer to numbers on the sketch.

- (1) D/F Station - was located about five kilometers north of Sarmellek Airfield, Point (7). For further details see Figure 2, site layout of the D/F station.
- (2) Macadam Road - about eight kilometers wide, connecting Sarmellek with Tapolea (N 46-53, E 17-26) and Kiskomárom (N 46-33, E 17-11). It was in a bad condition.

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- (3) Town of Sarmellek - had a population of about 1200 and consisted of two rows of one-story natural-stone, brick or adobe houses. They had gable roofs covered with tile, reed, or straw.
- (4) Sarmellek Railroad Station - had about four sidings and a station house of brick construction with a gable tile roof. Source observed a waiting room and a ticket office.
- (5) Double Railroad Line - was of European Standard Gauge (ESG) tracks and connected Sarmellek with Balatonszentgyorgy (N 46-41, E 17-18) and Zalaapati (N 46-44, E 17-06).
- (6) Railroad Spur - single ESG track, connected the Sarmellek Railroad station, Point (4), with the airfield, Point (7).
- (7) Sarmellek Airfield - 1
- (8) Runway - with taxi strip.²
- (9) Town of Zalavar (N 46-40, E 17-09) - [redacted]
- (10) Woods - small patches of deciduous trees were seen north and northwest of the D/F station.

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Site Layout of D/F Station

Figure 2, on page 14, is [redacted] sketch of the top view of the D/F Station near Sarmellek Airfield. Following is the legend to this sketch. Numbers and letters in parentheses refer to numbers and letters on the sketch.

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- (1) Radio Room of D/F Station - contained the following equipment:
 - a. One radio beacon transmitter (see Figure 6).
 - b. One radio-goniometer (see Figure 7).
 - c. Four R-40 radio transmitter-receiver units for telegraphic signal communication (see Figure 8).
 - d. "Ponia" transmitter-receiver for voice (see Figure 9).
- (2) Hall - entrance passage to three other rooms.
- (3) Concrete Ramp - to generator room.
- (4) Generator Room - contained a mobile gasoline-driven generator and the radio switch-control panel (see Figure 5).
- (5) Kitchen.
- (6) Barrack-room - contained four beds and a direct telephone line to Ground Flight Direction Service (FRISZ) and a dial telephone

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to the Sarmellek Telephone Exchange (Post Office).

(7) Long-Wave Antenna - an off-center fed long wire antenna. It consisted of a single horizontal copper cable line about 25 meters long, attached through insulators to two antenna masts at a height of 14-16 meters. The general line of direction was northeast-southwest. This antenna was used mostly for the radio beacon transmitter (see Point (H) of Figure 2).


(A) "Varsa" Antenna System - used for short-wave communication, it consisted of a series of eight lines of horizontal copper wires arranged in a circular shape and connected to the antenna masts by a winch. There were altogether eight similar sections in the "Varsa" system. Each section could be lowered by two men in ten minutes (See Point (AA), Figure 4).

(B) Lead-in Antenna - from the "Varsa" Antenna System. It was connected to the R-40 transmitter-receiver and to other equipment. The lead-in antenna itself consisted of two parallel copper cables, approximately 20 cm. apart, fastened together by a ceramic insulator, of very poor quality which crumbled under slight pressure (see Point (B) of Figure 4).

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(C) Guy Wire - fastened to the top of each antenna mast and anchored in concrete one meter deep (see Figure 4, Point C).

(D) Antenna Bracing Strut Assembly - connected to the antenna mast by a winch (see Point (D) of Figure 4).

Figure 3, on page 15, is  sketch of the east side view of the D/F station and antenna system near Sarmellek Airfield. Following is the legend to this sketch. Letters in parentheses refer to letters on the sketch.


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(E) Antenna-Mast Foundation - for details see Figure 4, Point (E)

(F) Antenna-Mast Bracing - fastened the antenna mast to two supporting poles which in turn were set four meters deep in the ground (see Point (F) of Figure 4).

(G) Long-wave Antenna Connection - for details see Figure 4, Point (G).

(H) Long-Wave Lead-in Antenna - consisted of three parallel wires separated by a three-pronged aluminum blade.

Figure 4, on page 16, is  sketch of construction details of the "Varsa" Antenna System. Following is the legend to this sketch. Letters in parentheses refer to letters on the sketch.

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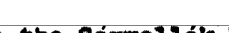
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- (A) **Cross Section - of the "Varsa" Short-wave antenna. Diameter was one meter.**
- (B) **"Varsa" Short-Wave Lead-in Antenna - consisted of two parallel copper cables separated by a series of ceramic insulators about 20 cm. long.**
- (C) **Guy Wire - was anchored in concrete about one meter deep. The guy could be loosened or tightened by a turn-buckle bracer, that coupled it to the concrete anchorage. The sketch shows a side-view of the foundation's construction.**
- (D) **Antenna Bracing Strut Assembly - connected the "Varsa" antenna to the mast support by a winch. Each antenna mast had a red warning light on its top.**
- (E) **Antenna-Mast Foundation Construction - the sketch shows front and side views of the antenna mast's construction below the surface of the ground. The mast was set four meters deep in the ground and was braced by a wooden perch set cross-wise in the middle and triangularly at the base of the construction.**
- (F) **Antenna-Mast Bracing - consisted of two bracing poles set in the ground (see Point (E) of Figure 4).**
- (G) **Long-Wave Antenna Insulator - was made of phosphore of lime or porcelain and coupled the long-wave antenna to the mast.**

Equipment of the D/F Station

7. Figure 5, on page 17, is  sketch of the radio switch control panel located in the Sarmellek D/F Station. This grey-painted panel was a 1.5 meters x 1 meter x 2 meters steel plate fastened to the wall, with a space 35cm. wide between the wall and the panel to give an electrician enough room to check electrical connections and make necessary repairs. The panel was manufactured and installed by the Elkimz Manufacturing Enterprises in Budapest. 50X1-HUM

 Following is the legend to this sketch.

Numbers in parentheses refer to numbers on the sketch.

- (1) **Indicator Lights - a red light indicated when the respective transmitter was in operation.**
- (2) **Voltmeters - measuring the strength of the current passing through the respective transmitters and receivers.**
- (3) **Ammeter - measured the amperage passing through the respective transmitters and receivers.**
- (4) **On-Off Switches - for turning the electric current on or off for a transmitter or receiver.**

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- (5) Automatic Push-Button Fuse - an overcurrent protective fuse, which automatically jumped out, disconnecting the circuit, in case of an overcurrent.
- (6) Hydraulic Fuse Control Mechanism - was incased and operated under oil pressure.

Radio Beacon Transmitter

18. Figure 6, on page 18, is sketch of the radio beacon transmitter located in the Sarmellek D/F Station. It was manufactured by the Elkis Mfg. Enterprises in Budapest. There were two or three such radio beacon sets at this D/F station. The set transmitted automatic station-identification signals as homing device for military aircraft. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch.

- (1) Cooling Vent.
- (2) Removable Plastic Glass - covered the automatic signal device.
- (3) "Malta" Cross - was made of steel and rotated automatically over the signal disc.
- (4) Signal Disc - was a round steel plate with set signals.
- (5) Cooling Vents.
- (6) Antenna Lead-in Connection.
- (7) Electric-Power Connection.
- (8) Rubber Legs - four altogether.
- (9) Name Plate - the name of the manufacturer which appeared on the plate read ELKISZ, which stood for the Electro Technical Small Industries Cooperative (Elektro Technikai Kisipari Szövetkezet). It carried other pertinent data such as type and serial number

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- (10) Automatic Contact Spring - closed the circuit at fixed intervals and sent out predetermined Morse signals.
- (11) Indicator Lights - lit up when the set was in operation.
- (12) On-Off Switch.

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Radio-Goniometer Transmitter

19. Figure 7, on page 19, is sketch of the radio-goniometer, located in the Sarmellek D/F Station. It was of British make, manufactured by the Marconi Company.

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Hungarian radio operators often referred to the set as the "Marconi", and that [redacted] English instruction booklets on the equipment. The radio goniometer was mounted on a table and was operated by one radio operator. Transmission and reception was by voice, by means of a built-in loud-speaker and portable microphone. The purpose of the radio-goniometer was to provide pilots with position, bearing, and altitude upon request. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch.

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- (1) Tuning Dial - in Kc's.
- (2) Goniometer Pointer - was manually operated.
- (3) Indicator Light - was red when set was in operation.
- (4) Indicator Light - was green [redacted]
- (5) Magic Eye - for fine tuning.
- (6) Voltmeter.
- (7) Name Plate - included the manufacturer's name "Marconi", "Type DRGF 25/2" and other pertinent data [redacted]
- (7a) Transmitter Switch.
- (8) Disc-Plate - calibrated to 360°.
- (9) Microphone.
- (10) Selector Switch - for microphone loud-speaker.
- (10a) Volume-Control Knob.
- (10b) Fine Tuning.
- (11) Loud-Speaker.
- (12) Indicator Light - for the loud speaker, it was red when in operation.
- (13) Indicator Light - for the microphone, it was yellow when in operation.
- (14) Main and Fine Tuning.
- (15) Band Switch.

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R-40 Radio Receiver-Transmitter

20. Figure 8, on page 20, is [redacted] sketch of the R-40 radio receiver-transmitter set located in the Sarmellek D/F station.

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This set was commonly referred to as the R-40, or Heavy Consolidated Receiver (Nehez Egyseges Vevo). This equipment transmitted and received CW code type of signals. This set was widely used by the Hungarian Air Force and also at Hungarian Air Force Headquarters (OLLEP). The R-40 was manufactured by the "Orion" company in Budapest. The sketches prepared of this equipment were classified "Secret". There were five of these sets at the Sarmellek D/F Station. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch.

- (1) Tuning Dial - in megacycles with continuous tuning over 5 bands.
- (2) Indicator Light - was red when set was in operation.
- (3) Handle - to handcarry set.
- (4) Band Selector.
- (5) Main and Fine Dial Knob.
- (5a) Antenna Lead-in Connection.
- (6) Power Connection.
- (7) Rubber Leg - (4) one on each corner.
- (8) Head-Phone Jacks.
- (8a) Filter Switch.
- (9) Voltmeter.
- (10) Name Plate - with "Orion" trade mark and other unidentified pertinent data.
- (11) Volume Control.
- (12) Teletype Key Jack.
- (12a) Pitch Control.
- (13) On-Off Switch.
- (14) Same as Point (3).

"Fonia" Radio Transmitter-Receiver

1. Figure 9, on page 21, is sketch of the radio transmitter-receiver for voice communication located in the Sarmellek D/F Station. This set was commonly referred to as the "Fonia" Type R-SZ-B-F. This set was used only for voice transmission and reception. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch.

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- (1) Tune Dial.
- (2) Band Selector.
- (3) Tuning-Control Knob.
- (4) Antenna Jack.
- (5) Power Connection.
- (6) On-Off Switch.
- (7) Loud-Speaker.
- (8) Volume Control.
- (9) Pitch Control.
- (10) Microphone Jack.
- (11) Microphone.
- (12) Indicator Light - red when in operation.

Radio Room Layout

2. Figure 10, on page 22, is  sketch of the radio room layout in the D/P station at Sarmellek Airfield. The sketch shows the physical location of the radio equipment in the room. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch. Equipment that is not numbered is explained on the sketch itself.

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- (1) Lead-in Connection - parallel lead-in antenna-wire connection to the "squirrel cage" type of antenna system. (See Figure 11).
- (2) Same as Point (1).
- (3) Radio Beacon Sets - three; however, only one was in operation at one time.
- (4) Lead-in Connection - parallel lead-in antenna wire connection from short-wave antenna.
- (5) Lead-in Connection - single lead-in antenna wire connection to long-wave antenna.
- (6) Underground Electric Cable - leading to radio equipment.
- (7) Door- 80 cm. wide.
- (8) Step-up Transformer - in wooden box, measuring approximately 1.2x1x1.5 meters.
- (9) Stove.

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- (10) Side Window - connected radio room with barracks room.
- (11) Lead-in Connection - parallel lead-in antenna wire connection, same as Point (1), except that it was fed through the west side of the D/F station (See Point B of Figure 2).

Antenna Feed-Through Arrangement Switch

3. Figure 11, on page 23, is  sketch of front and side views of the antenna feed-through arrangement switch for the "Varsa" (Squirrel-Cage type) Antenna System. The feed-through arrangement was attached to the wall of the D/F station, through an opening about 75 cm. in height, covered with an iron plate. The antennas could be disengaged manually by a toggle joint mechanism operated from the radio room. Following is the legend to this sketch. Numbers in parentheses refer to numbers on the sketch. 50X1-HUM

- (1) and (1a) Connecting Joint - for the antenna wire. The antenna wire was bolted by two screws to the lead-in brass rod.
- (1b) Hinged Tied Shaft - which disengaged the antenna from the lead-in rod.
- (2) Insulator - made of porcelain. Through the middle ran the lead-in antenna connecting brass rod.
- (3) Hinge Joint Crank - was operated manually by pulling a handle (not shown on sketch) to engage or disengage the antenna connection (Point A).

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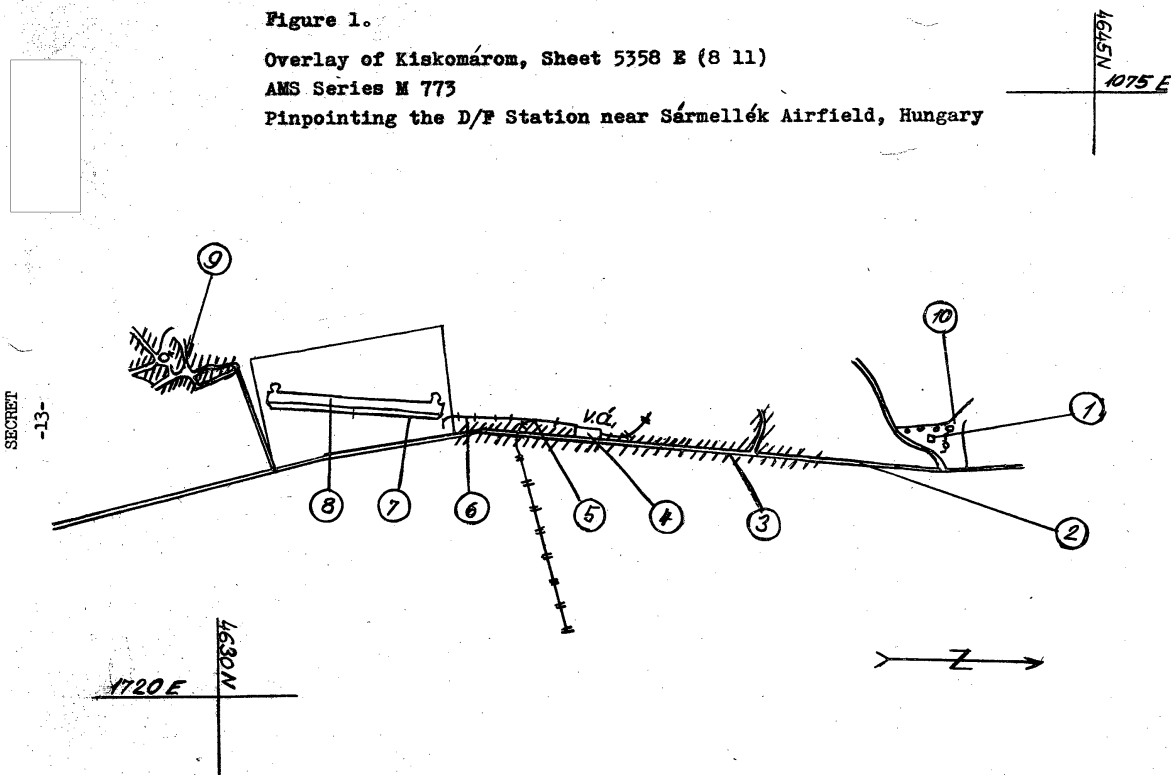
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Figure 1.

Overlay of Kiskomárom, Sheet 5358 E (8 11)

AMS Series M 773

Pinpointing the D/F Station near Sármellék Airfield, Hungary



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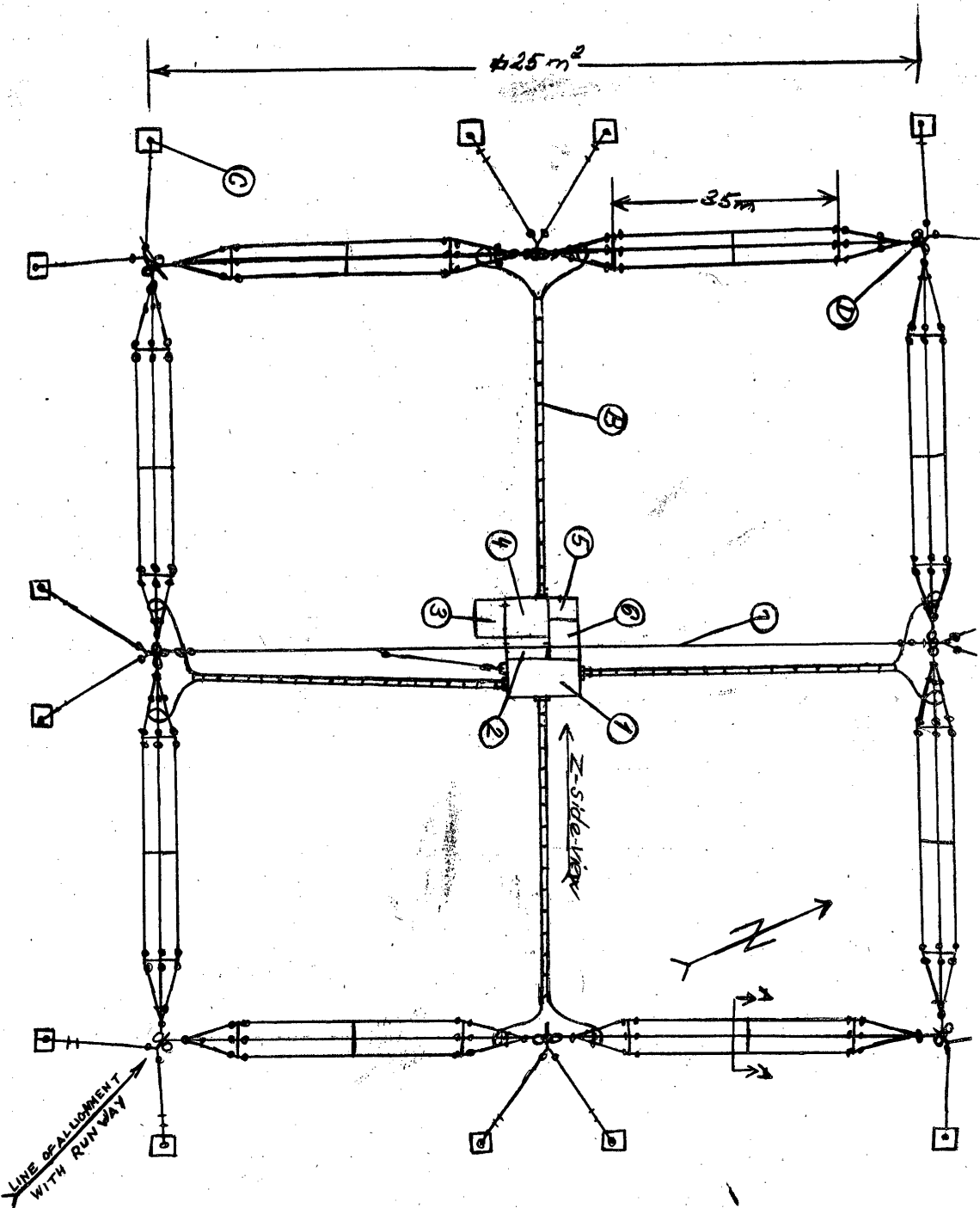
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Sketch

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Figure 2.
Top-View of the D/F Station and Antenna System
near the Sarmellek Airfield (4643N - 1710E),
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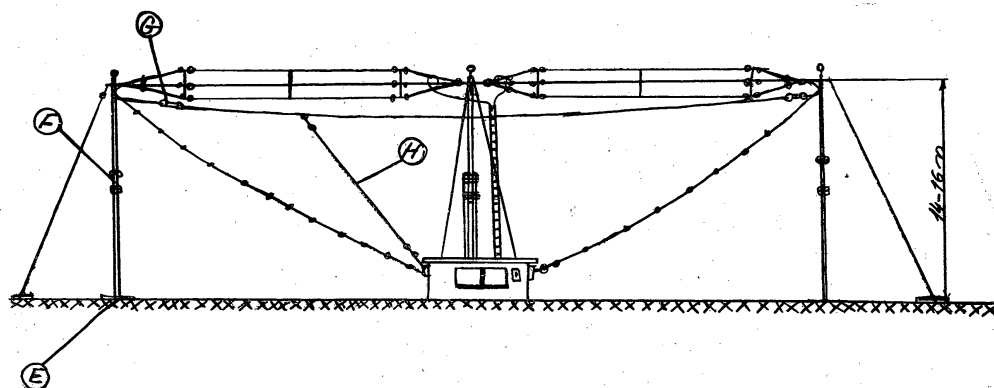
Figure 3.

Sketch

Side-View (Z) of the D/F Station and Antenna System
near the Sármellék Airfield (4643N- 1710E), Hungary

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Z = SIDE-VIEW



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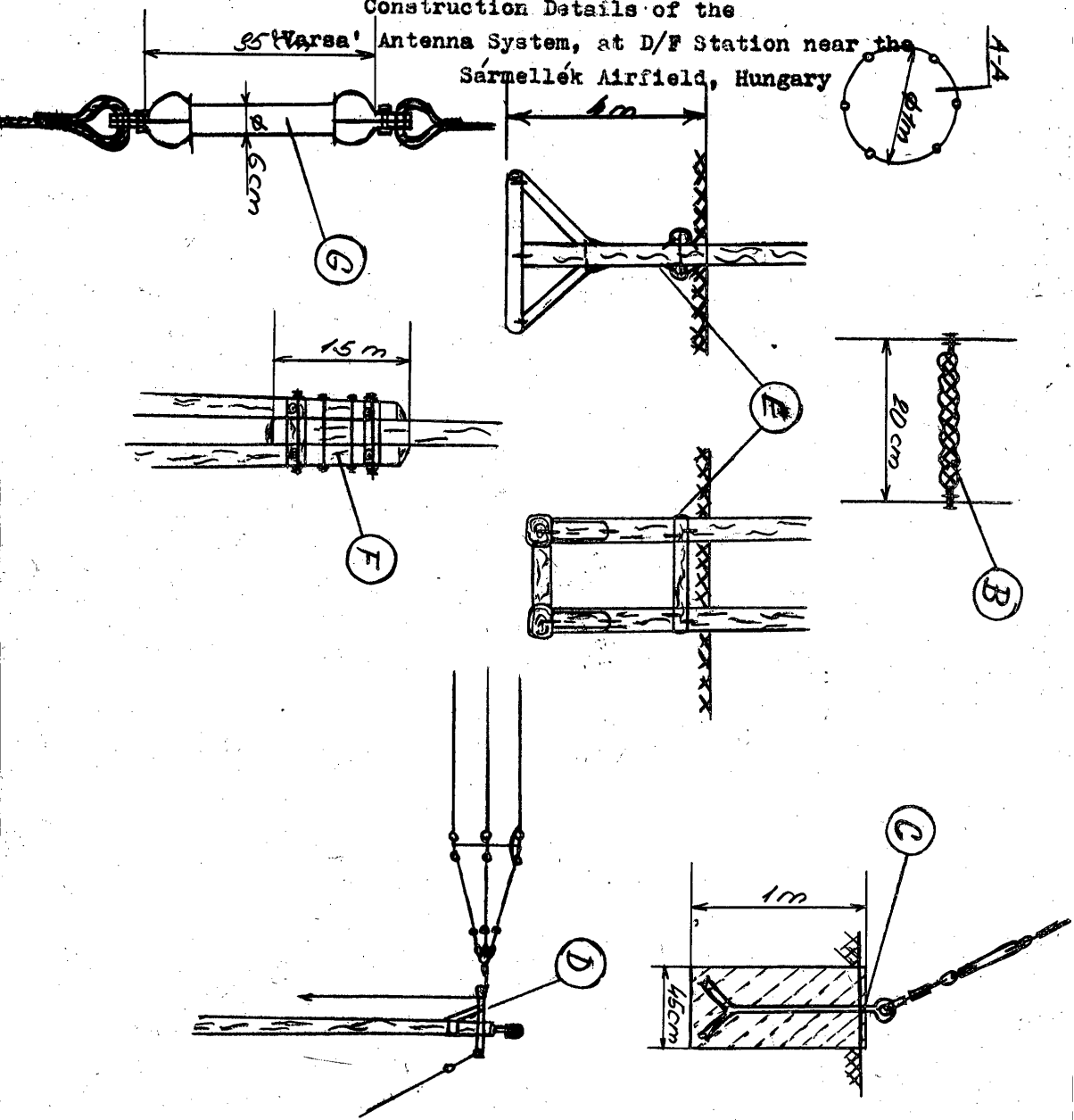
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Figure 4.

Sketch

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Construction Details of the
"Warsa" Antenna System, at D/F Station near the
Sármellék Airfield, Hungary



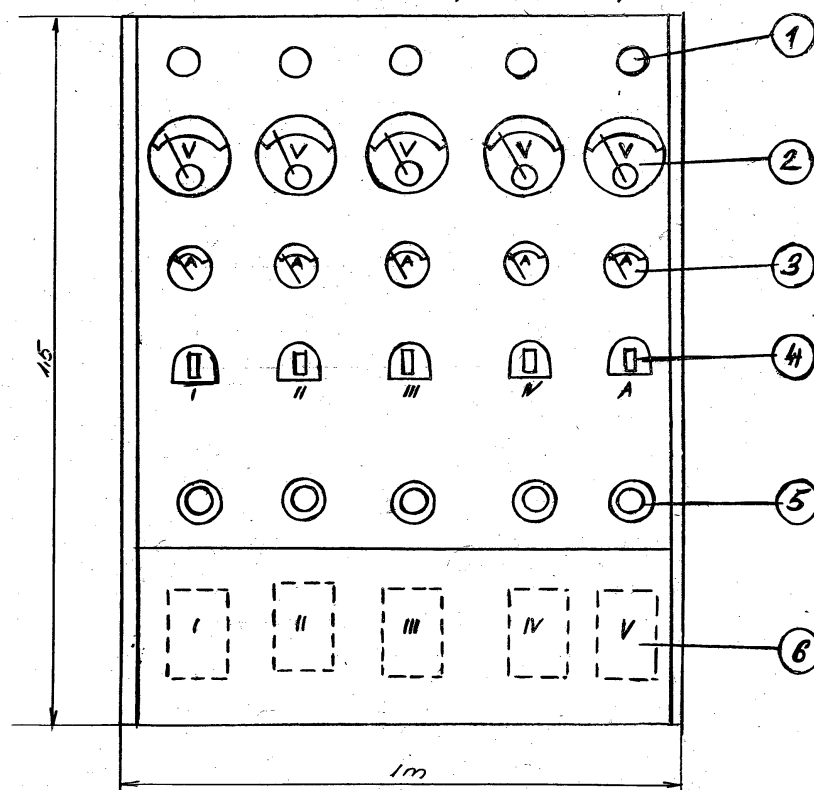
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Figure 5. Sketch

Radio Switch - Control Panel; Located in D/F Station - Sarmellek Airfield

(N4643-E1710)

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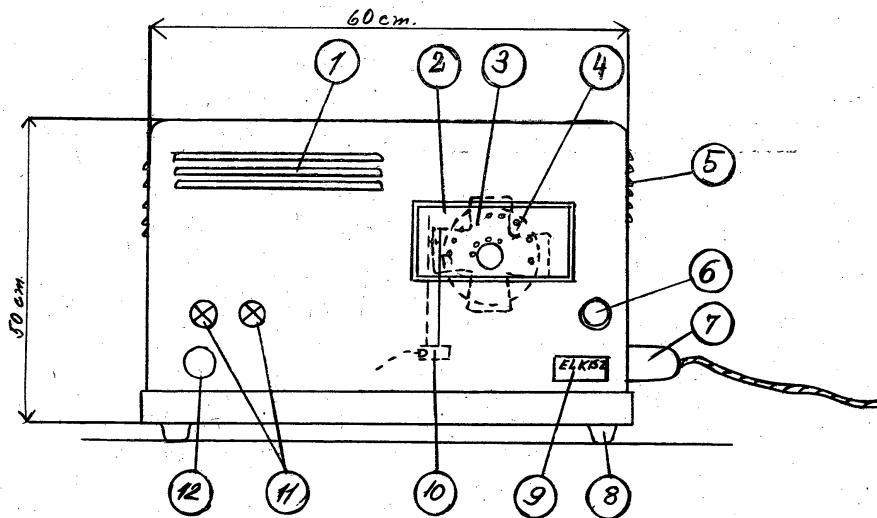
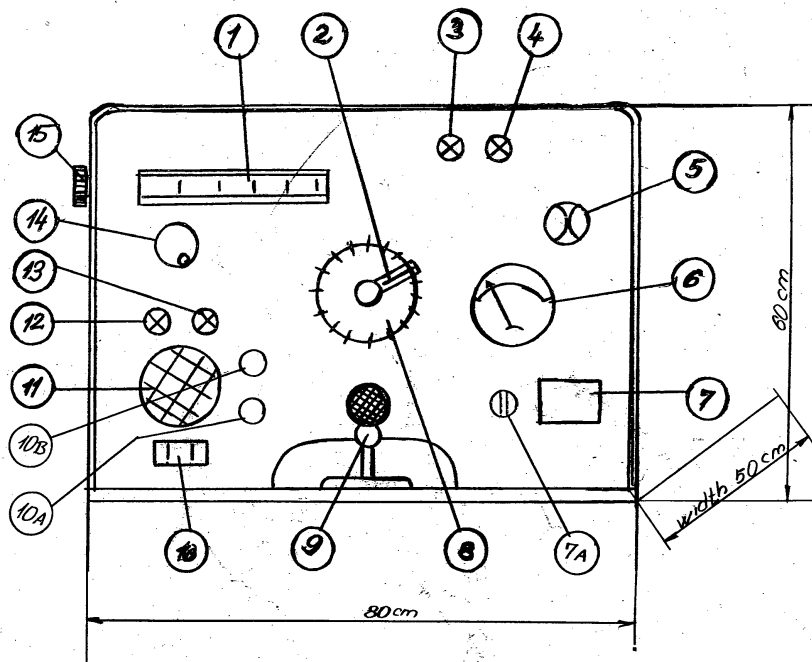


Figure 6. Sketch
Radio Beacon Transmitter
Located in D/F Station - Sármellék Airfield (N4643-E1710), Hungary



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Sketch

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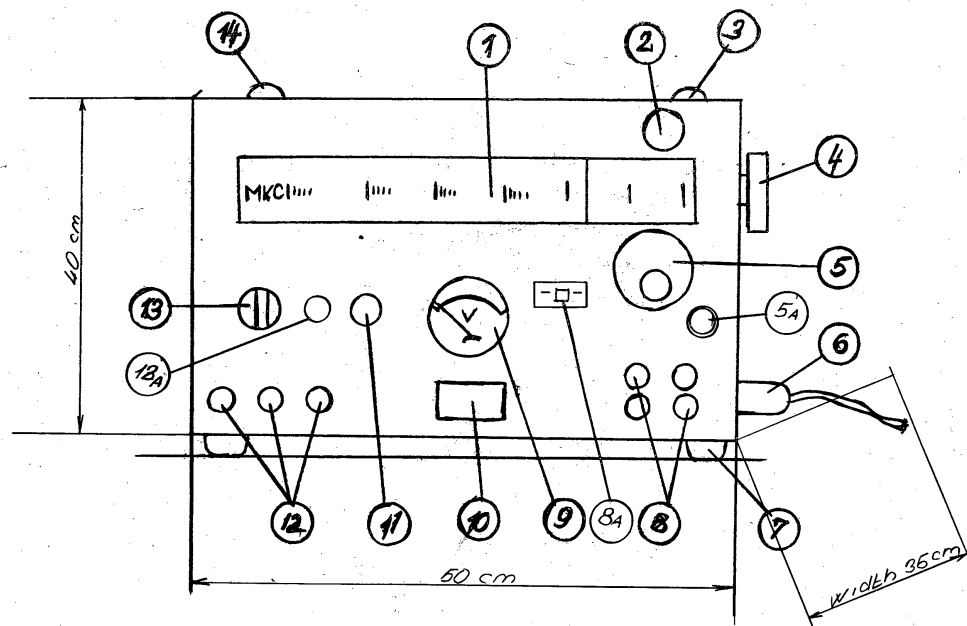


Figure 8.

Sketch

Radio Transmitter-Receiver Unit (CW) - R-40
 Located in D/F Station - Sármellék Airfield (N4643-EL710)

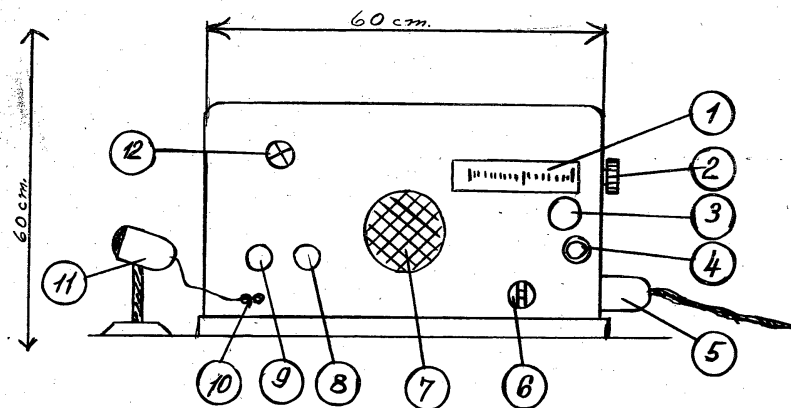


Figure 9.

Sketch

'Ponia' Radio Transmitter-Receiver, Type-BSzBF

Located in D/F Station - Sarmellek Airfield (N4643-E1710)

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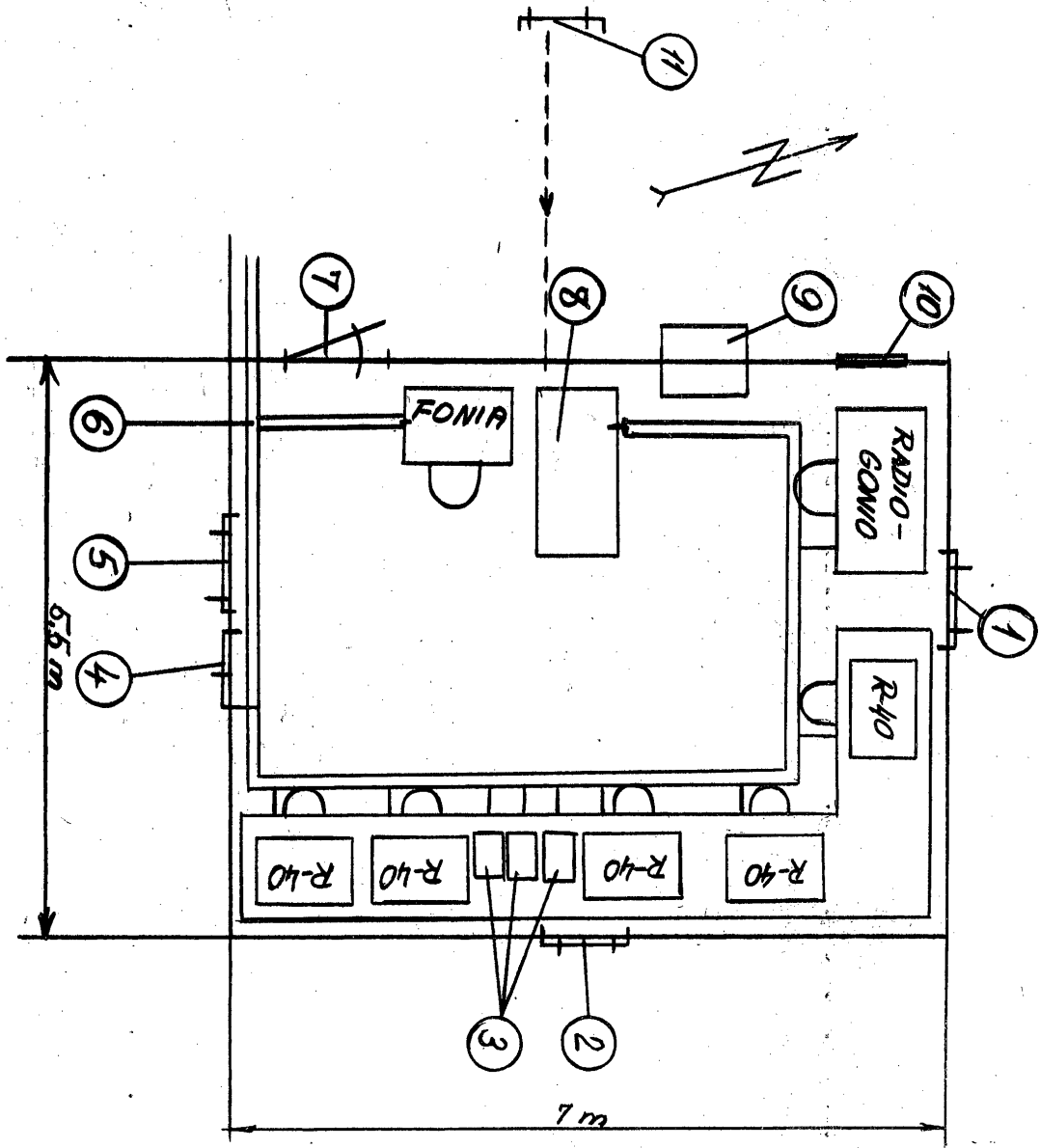
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Figure 10.

Sketch of the Radio Room Layout in D/F Station - Sarmellek Airfield (N4643 - E1710) Hungary 50X1-HUM



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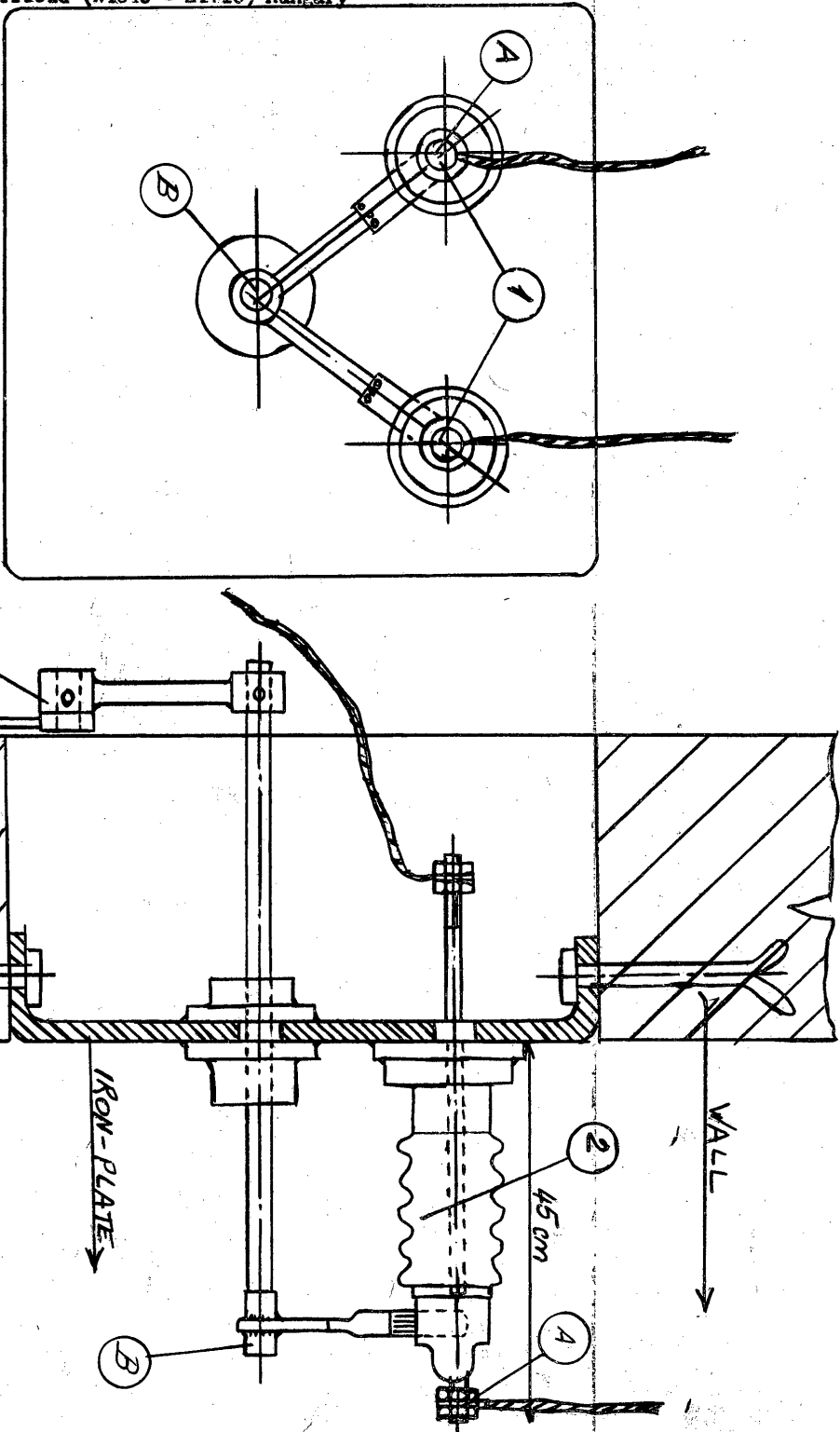
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Figure 11.
Sketch of the Antenna Feed-Through Arrangement in the D/F Station 50X1-HUM
Sarmellek Airfield (N4643 - E1710) Hungary

FRONT-VIEW
ANTENNA-BEVEZETO "KAPCSOLO."



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